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PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Assistant Commissioner for Patents
United States Patent and Trademark Office
Box PCT
Washington, D.C.20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 10 February 2000 (10.02.00)	
International application No. PCT/NL99/00303	**Applicant's or agent's file reference** BO 41838
International filing date (day/month/year) 18 May 1999 (18.05.99)	**Priority date** (day/month/year) 18 May 1998 (18.05.98)
Applicant OLSCHEWSKI, Armin, Herbert, Emil, August et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

07 December 1999 (07.12.99)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer R. E. Stoffel
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

Form PCT/IB/331 (July 1992) 3101685

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and Administrative Instructions, Section 422)

To:

DE BRUIJN, Leendert, C.
Nederlandsch Octrooibureau
Scheveningseweg 82
P.O. Box 29720
NL-2502 LS The Hague
PAYS-BAS

Date of mailing (day/month/year)
11 September 2000 (11.09.00)

Applicant's or agent's file reference
BO 41838

IMPORTANT NOTIFICATION

International application No.
PCT/NL99/00303

International filing date (day/month/year)
18 May 1999 (18.05.99)

1. The following indications appeared on record concerning:

[X] the applicant [X] the inventor [ ] the agent [ ] the common representative

Name and Address
OLSCHEWSKI, Armin, Herbert, Emil, August
Nedereindseweg 121
NL-3438 AC Nieuwegein
Netherlands

State of Nationality: DE
State of Residence: NL
Telephone No.:
Facsimile No.:
Teleprinter No.:

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

[ ] the person [ ] the name [X] the address [ ] the nationality [X] the residence

Name and Address
OLSCHEWSKI, Armin, Herbert, Emil, August
Strösselstrasse 8
D-97422 Schweinfurt
Germany

State of Nationality: DE
State of Residence: DE
Telephone No.:
Facsimile No.:
Teleprinter No.:

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

[X] the receiving Office
[ ] the International Searching Authority
[ ] the International Preliminary Examining Authority
[ ] the designated Offices concerned
[X] the elected Offices concerned
[ ] other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

Authorized officer
Peggy Steunenberg
Telephone No.: (41-22) 338.83.38

Copy for the Elected Office (EO/US) PCT/NL99/00303

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and Administrative Instructions, Section 422)

To:

DE BRUIJN, Leendert, C.
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IMPORTANT NOTIFICATION

International application No.
PCT/NL99/00303

International filing date (day/month/year)
18 May 1999 (18.05.99)

1. The following indications appeared on record concerning:

[X] the applicant [X] the inventor [ ] the agent [ ] the common representative

Name and Address
VAN WINDEN, Johannes, Albertus
Molenwal 4
NL-3421 CM Oudewater
Netherlands
Netherlands

State of Nationality: NL
State of Residence: NL
Telephone No.:
Facsimile No.:
Teleprinter No.:

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

[ ] the person [ ] the name [X] the address [ ] the nationality [X] the residence

Name and Address
VAN WINDEN, Johannes, Albertus
Mönchhofstrasse 3B
D-69120 Heidelberg
Germany

State of Nationality: NL
State of Residence: DE
Telephone No.:
Facsimile No.:
Teleprinter No.:

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

[X] the receiving Office
[ ] the International Searching Authority
[ ] the International Preliminary Examining Authority
[ ] the designated Offices concerned
[X] the elected Offices concerned
[ ] other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

Authorized officer
Peggy Steunenberg
Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

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Name and Address
OLSCHEWSKI, Armin, Herbert, Emil, August
Nedereindseweg 121
NL-3438 AC Nieuwegein
Netherlands

State of Nationality: DE
State of Residence: NL
Telephone No.:
Facsimile No.:
Teleprinter No.:

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

[ ] the person [ ] the name [X] the address [ ] the nationality [X] the residence

Name and Address
OLSCHEWSKI, Armin, Herbert, Emil, August
Strösselstrasse 8
D-97422 Schweinfurt
Germany

State of Nationality: DE
State of Residence: DE
Telephone No.:
Facsimile No.:
Teleprinter No.:

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

[X] the receiving Office
[ ] the International Searching Authority
[ ] the International Preliminary Examining Authority
[ ] the designated Offices concerned
[X] the elected Offices concerned
[ ] other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

Authorized officer
Peggy Steunenberg
Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

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NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and Administrative Instructions, Section 422)

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NL-2502 LS The Hague
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Date of mailing (day/month/year)
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BO 41838

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International application No.
PCT/NL99/00303

International filing date (day/month/year)
18 May 1999 (18.05.99)

1. The following indications appeared on record concerning:

[X] the applicant [X] the inventor [ ] the agent [ ] the common representative

Name and Address
VAN WINDEN, Johannes, Albertus
Molenwal 4
NL-3421 CM Oudewater
Netherlands
Netherlands

State of Nationality: NL
State of Residence: NL
Telephone No.:
Facsimile No.:
Teleprinter No.:

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

[ ] the person [ ] the name [X] the address [ ] the nationality [X] the residence

Name and Address
VAN WINDEN, Johannes, Albertus
Mönchhofstrasse 3B
D-69120 Heidelberg
Germany

State of Nationality: NL
State of Residence: DE
Telephone No.:
Facsimile No.:
Teleprinter No.:

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

[X] the receiving Office
[ ] the International Searching Authority
[ ] the International Preliminary Examining Authority
[ ] the designated Offices concerned
[X] the elected Offices concerned
[ ] other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

Authorized officer
Peggy Steunenberg
Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
BO 41838		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/NL 99/00303	18/05/1999	18/05/1998

Applicant

SFK ENGINEERING & RESEARCH CENTRE B.V. et al.

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language,** the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readble form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [ ] **Unity of invention is lacking** (see Box II).

4. With regard to the **title,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

   [ ] the text is approved as submitted by the applicant.

   [X] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 1

   [ ] as suggested by the applicant.

   [X] because the applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

   [ ] None of the figures.

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference *(if desired) (12 characters maximum)* BO 41838

Box No. I TITLE OF INVENTION

Screw actuator, and brake calliper comprising such actuator

Box No. II APPLICANT

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

SKF ENGINEERING & RESEARCH CENTRE B.V.
P.O. Box 2350
NL-3430 DT NIEUWEGEIN
THE NETHERLANDS

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State *(that is, country)* of nationality: The Netherlands (NL)

State *(that is, country)* of residence: the Netherlands (NL)

This person is applicant for the purposes of: ☐ all designated States ☒ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

OLSCHEWSKI, Armin Herbert Emil August
Nedereindseweg 121
NL-3438 AC NIEUWEGEIN
THE NETHERLANDS

This person is:
☐ applicant only
☒ applicant and inventor
☐ inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality: Germany (DE)

State *(that is, country)* of residence: The Netherlands (NL)

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

DE BRUIJN, Leendert C. et al
Nederlandsch Octrooibureau
Scheveningseweg 82, P.O. Box 29720
NL-2502 LS The Hague
THE NETHERLANDS

Telephone No. 70 3527500

Facsimile No. 70 3527528

Teleprinter No.

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

If none of the following sub-boxes is used, this sheet should not be included in the request.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

KAPAAN, Henricus Jan
Waterhoen 5
NL-3435 DM NIEUWEGEIN
THE NETHERLANDS

This person is:
- ☐ applicant only
- ☒ applicant and inventor
- ☐ inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality: The Netherlands (NL)

State *(that is, country)* of residence: The Netherlands (NL)

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

DRUET, Clair
283 Route la Carnalaz
F-73420 DRUMETTAZ CLARAFOND
FRANCE

This person is:
- ☐ applicant only
- ☒ applicant and inventor
- ☐ inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality: France (FR)

State *(that is, country)* of residence: France (FR)

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

FUCKS, Thomas Wilhelm
Salierallee 54
D-52066 AACHEN
GERMANY

This person is:
- ☐ applicant only
- ☒ applicant and inventor
- ☐ inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality: Germany (DE)

State *(that is, country)* of residence: Germany (DE)

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

ZWARTS, Jacobus
Carmenlaan 5
NL-3438 VA NIEUWEGEIN
THE NETHERLANDS

This person is:
- ☐ applicant only
- ☒ applicant and inventor
- ☐ inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality: The Netherlands (NL)

State *(that is, country)* of residence: The Netherlands (NL)

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on another continuation sheet.

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

If none of the following sub-boxes is used, this sheet should not be included in the request.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

WINDEN VAN, Johannes Albertus
MOlenwal 4
NL-3421 CM OUDEWATER
THE NETHERLANDS

This person is:
- ☐ applicant only
- ☒ applicant and inventor
- ☐ inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality: The Netherlands (NL)

State *(that is, country)* of residence: The Netherlands (NL)

This person is applicant for the purposes of:
- ☐ all designated States
- ☐ all designated States except the United States of America
- ☒ the United States of America only
- ☐ the States indicated in the Supplemental Box

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

RINSMA, Andries Christian
Leidseweg 73
NL-3531 BE UTRECHT
THE NETHERLANDS

This person is:
- ☐ applicant only
- ☒ applicant and inventor
- ☐ inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality: The Netherlands (NL)

State *(that is, country)* of residence: The Netherlands (NL)

This person is applicant for the purposes of:
- ☐ all designated States
- ☐ all designated States except the United States of America
- ☒ the United States of America only
- ☐ the States indicated in the Supplemental Box

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

GURKA, Jiri
Penz 290
A-4441 BEHAMBERG
AUSTRIA

This person is:
- ☐ applicant only
- ☒ applicant and inventor
- ☐ inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality: Austria (AT)

State *(that is, country)* of residence: Austria (AT)

This person is applicant for the purposes of:
- ☐ all designated States
- ☐ all designated States except the United States of America
- ☒ the United States of America only
- ☐ the States indicated in the Supplemental Box

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

This person is:
- ☐ applicant only
- ☐ applicant and inventor
- ☐ inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality:

State *(that is, country)* of residence:

This person is applicant for the purposes of:
- ☐ all designated States
- ☐ all designated States except the United States of America
- ☐ the United States of America only
- ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.

Box No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) *(mark the applicable check-boxes; at least one must be marked)*:

Regional Patent

- ☒ AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT *(if other kind of protection or treatment desired, specify on dotted line)* .....

National Patent *(if other kind of protection or treatment desired, specify on dotted line)*:

- ☒ AL Albania .....
- ☒ AM Armenia .....
- ☒ AT Austria .....
- ☒ AU Australia .....
- ☒ AZ Azerbaijan
- ☒ BA Bosnia and Herzegovina .....
- ☒ BB Barbados
- ☒ BG Bulgaria .....
- ☒ BR Brazil .....
- ☒ BY Belarus .....
- ☒ CA Canada
- ☒ CH and LI Switzerland and Liechtenstein
- ☒ CN China .....
- ☒ CU Cuba .....
- ☒ CZ Czech Republic .....
- ☒ DE Germany .....
- ☒ DK Denmark .....
- ☒ EE Estonia .....
- ☒ ES Spain .....
- ☒ FI Finland .....
- ☒ GB United Kingdom
- ☒ GD Grenada
- ☒ GE Georgia .....
- ☒ GH Ghana .....
- ☒ GM Gambia
- ☒ HR Croatia .....
- ☒ HU Hungary .....
- ☒ ID Indonesia
- ☒ IL Israel .....
- ☒ IN India .....
- ☒ IS Iceland
- ☒ JP Japan .....
- ☒ KE Kenya .....
- ☒ KG Kyrgyzstan .....
- ☒ KP Democratic People's Republic of Korea .....
- ☒ KR Republic of Korea .....
- ☒ KZ Kazakhstan .....
- ☒ LC Saint Lucia
- ☒ LK Sri Lanka
- ☒ LR Liberia
- ☒ LS Lesotho .....
- ☒ LT Lithuania
- ☒ LU Luxembourg
- ☒ LV Latvia
- ☒ MD Republic of Moldova .....
- ☒ MG Madagascar .....
- ☒ MK The former Yugoslav Republic of Macedonia .....
- ☒ MN Mongolia
- ☒ MW Malawi .....
- ☒ MX Mexico .....
- ☒ NO Norway
- ☒ NZ New Zealand .....
- ☒ PL Poland .....
- ☒ PT Portugal .....
- ☒ RO Romania
- ☒ RU Russian Federation .....
- ☒ SD Sudan
- ☒ SE Sweden
- ☒ SG Singapore
- ☒ SI Slovenia .....
- ☒ SK Slovakia .....
- ☒ SL Sierra Leone
- ☒ TJ Tajikistan .....
- ☒ TM Turkmenistan .....
- ☒ TR Turkey .....
- ☒ TT Trinidad and Tobago .....
- ☒ UA Ukraine .....
- ☒ UG Uganda .....
- ☒ US United States of America .....
- ☒ UZ Uzbekistan .....
- ☒ VN Viet Nam .....
- ☒ YU Yugoslavia .....
- ☒ ZW Zimbabwe .....

Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet:

- ☒ AE United Arab Emirates .....
- ☒ ZA South Africa .....
- ☐ .....

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. *(Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)*

Box No. VI PRIORITY CLAIM ☐ Further priority claims are indicated in the Supplemental Box.

Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is: national application: country	regional application:* regional Office	international application: receiving Office
item (1) 18 May 1998	1009197	NL		
item (2)				
item (3)				

☒ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) *(only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office)* identified above as item(s): 1

* *Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.*

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) *(If two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):* ISA / EPA

Request to use results of earlier search; reference to that search *(if an earlier search has been carried out by or requested from the International Searching Authority):*

Date *(day/month/year)*: 14 January 1999 — Number: SN 31448 NL — Country *(for regional Office)*: NL

Box No. VIII CHECK LIST; LANGUAGE OF FILING

This international application contains the following number of sheets:

request	:	5
description (excluding sequence listing part)	:	5
claims	:	5
abstract	:	1
drawings	:	4
sequence listing part of description	:	
Total number of sheets	:	20

This international application is accompanied by the item(s) marked below:

1. ☒ fee calculation sheet
2. ☐ separate signed power of attorney
3. ☐ copy of general power of attorney; reference number, if any:
4. ☐ statement explaining lack of signature
5. ☐ priority document(s) identified in Box No. VI as item(s):
6. ☐ translation of international application into (language):
7. ☐ separate indications concerning deposited microorganism or other biological material
8. ☐ nucleotide and/or amino acid sequence listing in computer readable form
9. ☒ other *(specify)*: Copy search report

Figure of the drawings which should accompany the abstract:

Language of filing of the international application: NL

Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

JORRITSMA, R.

Nederlandsch Octrooibureau, The Hague — May 18, 1999

For receiving Office use only

1. Date of actual receipt of the purported international application:	2. Drawings: ☐ received: ☐ not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:	
4. Date of timely receipt of the required corrections under PCT Article 11(2):	
5. International Searching Authority (if two or more are competent): ISA /	6. ☐ Transmittal of search copy delayed until search fee is paid.

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Date of receipt of the record copy by the International Bureau:

This sheet is not part of and does not count as a sheet of the international application.

PCT

FEE CALCULATION SHEET

Annex to the Request

For receiving Office use only

International application No.

Date stamp of the receiving Office

Applicant's or agent's file reference: BO 41838-400

Applicant: SKF Engineering & Research Centre B.V.

CALCULATION OF PRESCRIBED FEES

1. TRANSMITTAL FEE . . . . . 110 [T]

2. SEARCH FEE . . . . . 2476 [S]

International search to be carried out by EPO

(If two or more International Searching Authorities are competent in relation to the international application, indicate the name of the Authority which is chosen to carry out the international search.)

3. INTERNATIONAL FEE

Basic Fee

The international application contains 20 sheets.

first 30 sheets . . . . . 910 [b1]

____ (remaining sheets) x 22 (additional amount) = [b2]

Add amounts entered at b1 and b2 and enter total at B . . . . 910 [B]

Designation Fees

The international application contains all designations.

10 (number of designation fees payable *(maximum 11)*) x 209 (amount of designation fee) = 2090 [D]

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(Applicants from certain States are entitled to a reduction of 75% of the international fee. Where the applicant is (or all applicants are) so entitled, the total to be entered at I is 25% of the sum of the amounts entered at B and D.)

4. FEE FOR PRIORITY DOCUMENT *(if applicable)* . . . . . [P]

5. TOTAL FEES PAYABLE . . . . . 5586 TOTAL

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☐ The designation fees are not paid at this time.

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May 18, 1999 (Date *(day/month/year)*)

JANSSEN, F.H.J.F. (Signature)

REPLACED BY ART 34 AMDT.

16

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
BO 41838		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/NL99/00303	18/05/1999	18/05/1998
International Patent Classification (IPC) or national classification and IPC F16D65/16		
Applicant SFK ENGINEERING & RESEARCH CENTRE B.V. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 10 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
07/12/1999	20.06.2000
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Hillebrand, S Telephone No. +49 89 2399 2912

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/NL99/00303

I. Basis of th report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

2	as originally filed			
1,3-5	as received on	02/05/2000	with letter of	02/05/2000

Claims, No.:

1-6,17-24	as originally filed			
7-16,25-34	as received on	02/05/2000	with letter of	02/05/2000

Drawings, sheets:

1/3-3/3	as received on	19/05/2000	with letter of	19/05/2000

2. The amendments have resulted in the cancellation of:

☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims 1-34
	No:	Claims
Inventive step (IS)	Yes:	Claims 1-34
	No:	Claims
Industrial applicability (IA)	Yes:	Claims 1-34
	No:	Claims

2. Citations and explanations

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Reference is made to the following documents:

D1: GB-A-2 291 949
D2: EP-A-0 275 783.

Re Item V

1. The subject-matter of first independent claim 1 meets the requirements of Article 33(1) PCT.

   D1 discloses as closest prior art an nut-screw type actuator according to the preamble of claim 1 (see Fig. 1).
   From this known actuator, the subject-matter of claim 1 differs in that the nut is fixed into the housing, thereby supporting rotatably the screw by means of rolling elements.
   Thus, the subject-matter of claim 1 is new in the sense of Article 33(2) PCT.

   The problem to be solved by the present invention can be considered as providing an actuator with compact design. Since the nut is fixed, no further rotational bearing is necessary for the screw, and due to this omission of a part, the actuator is more compact.
   Among the cited documents, only D2 shows an actuator wherein the screw (15) effects simultaneously a rotational **and** a translational movement with regard to the housing. The nut (13), however, is not fixed, but additionally rotating in order to further reduce the translational speed of the screw (see Fig. 3, column 9, lines 3 to 50).
   Therefore, the subject-matter of claim 1 is not derivable in an obvious manner from the prior art and involves, thus, an inventive step in the sense of Article 33(3) PCT.

2. Dependent claims 2 to 29 relate to further embodiments of the invention according to claim 1;
   consequently, their respective subject-matter meets also the requirements of Article 33(1) PCT.

3. Second, third and fourth independent claims 30, 31 and 34 relate to a brake calliper, a continuously variable transmission and a clutch, respectively, each of these comprising an actuator according to claim 1;
therefore, their respective subject-matter meets the requirements of Article 33(1) PCT.

4. Dependent claims 32 and 33 relate to further embodiments of the transmission according to claim 31;
consequently, their respective subject-matter meets also the requirements of Article 33(1) PCT.

Re Item VIII

5. Claim 6 is not clear due to its incorrect back-reference (Article 6 PCT).

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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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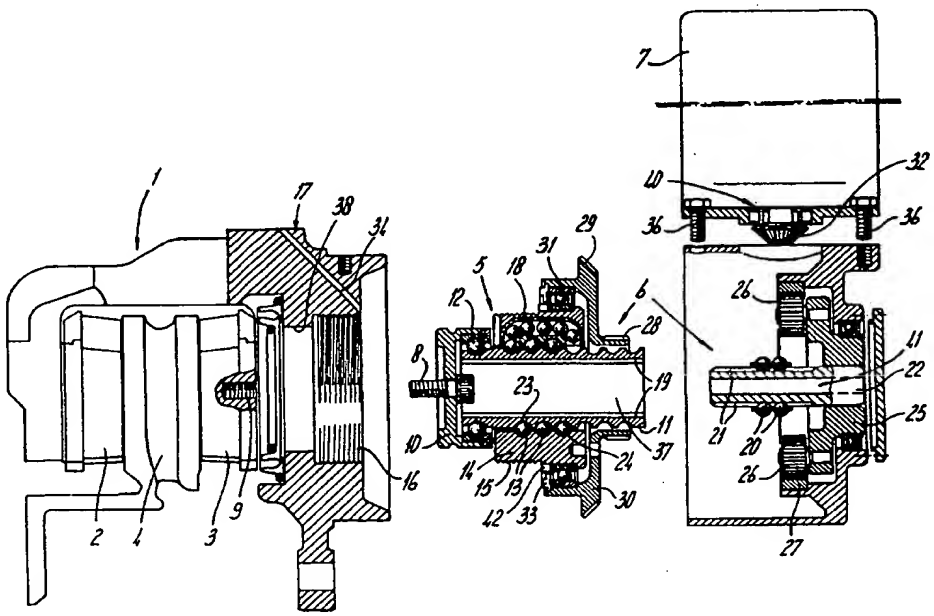
(54) Title: SCREW ACTUATOR, AND BRAKE CALLIPER COMPRISING SUCH ACTUATOR



(57) Abstract

A screw actuator comprises a housing (17), a motor (7), an actuating member (10) and a screw mechanism (5) which provides a linear movement of the actuating member with respect to the housing in response to a rotational movement of the motor, which screw mechanism comprises a screw (11), a nut (14) engaging each other by rolling elements (13), one of said screw and nut being rotatably supported with respect to the housing, and a reduction gear means (6). The nut is fixed with respect to the housing, and the screw is rotatably supported with respect to the housing by means of the rolling elements.

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Screw actuator, and brake calliper comprising such actuator

The invention is related to a screw actuator, comprising an actuating member and a screw mechanism having a screw, nut and rolling elements, one of which screw and nut is rotatably supported with respect to the housing and providing a linear movement of the actuating member with respect to the housing in response to a rotational movement of the motor, and a reduction gear means.

Such screw actuator is known from WO-A-9603301. Said known screw actuator comprises a screw mechanism which is supported with respect to the housing by means of a bearing capable of accommodating axial and/or radial loads, e.g. an axial thrust bearing for accommodating the axial forces exerted on the brakepads.

This screw mechanism is a so-called roller screw mechanism. Depending on the application condition constraints i.e. space available, and load, one can select a roller screw or a ball screw type actuator. Specific application considerations for a roller screw is that such roller screw mechanism provides a high power density, which means that within specific dimensional constraints, a relatively high load carrying capacity can be provided. Said carrying capacity however is predominantly related to axial loads. With respect to radial loads, the carrying capacity is less favourable compared to a ball screw. A roller screw mechanism is in general more sensitive with respect to radial loads and misalignment.

Another specific component in a roller screw mechanism is the cage which is necessary to space the rollers. In high speed applications this cage mass results in higher starting torques.

The object of the invention is to provide an improved actuator. This object is achieved in that the nut is fixed with respect to the housing, and the screw is rotatably supported with respect to the housing by means of the rolling elements. Said rolling elements may comprise rollers or balls.

In order to obtain about the same load bearing capacity as in a roller screw mechanism, the pitch diameter of the rolling balls, the ball diameter and its contact angle with screw and nut, and the number of turns should be designed such that appropriate dimensions and the required load carrying capacity are provided. However, as the rolling elements of the screw mechanism can also act as bearing elements for supporting the rotating screw, no separate bearing is necessary to take

up the axial load. As a result, the overall dimensions for a ball screw mechanism may remain limited in order to meet application requirements.

The ball screw mechanism is less sensitive with respect to radial loads, which makes it less vulnerable for misalignments. Also, no cage is needed for recirculation of the balls. Instead, recirculation of the balls may be obtained by means of recirculation tube or hole plug between the first and the last ball row or for each ball turn.

The axial moving and rotating screw according to the invention may be driven by the reduction gear means through a coupling means which allows axial displacements. Said coupling means may comprise a drive shaft accommodated within a bore in the screw, the surface of the drive shaft and the bore having axial grooves which engage each other through balls or splines.

The screw may engage the actuating member through a bearing capable to cope with radial and axial load in order to stop the rotating motion in relation to the moving actuating member.

The reduction gear means is preferably contained in a reduction gear module and the screw mechanism is contained in a screw mechanism module.

The actuating member may be executed as a piston, which is slidably held within a cylinder space of the housing. Said piston can be held non-rotatably by means of a groove and pin assembly. The motor drive module can be mounted in-line with the actuator or in angled position.

For a right angle position of the motor module, the reduction gear means may comprise one or more reduction steps with at least part of a planetary gear system having a stationary outer ring gear wheel with inwardly pointing gear teeth. In particular, the reduction gear means may comprise satellite gear wheels which mesh with the ring gear wheel and which are accommodated on a carrier connected to a rotary shaft engaging the screw mechanism, and the sun gear wheel of the planetary gear system may be accommodated on a drive shaft of the drive module. This system provides an optimal axial compactness of the application.

The sun gear wheel of the reduction gear means is connected to an angled or right angle gear reduction e.g. a bevel gear which mates with a motor driven bevel pinion. Said sun gear wheel and the bevel gear are carried out as a unitary gear wheel which is supported with respect to the nut of the screw mechanism by means

of a rolling element bearing. In order to achieve an appropriate reduction, the pitch diameter of the bevel gear is larger than the pitch diameter of the sun gear wheel.

Furthermore, a sensor fixed on a bearing or near the motorshaft may be provided for detecting rotational and/or translational movements of the screw mechanism or other operating parameters. Also, control means may be provided, said control means having an input for a control signal, e.g. from a brake pedal, and being connected to the sensor for controlling the electric motor on the basis of the control signal and the signal from the sensor. The sensor is in particular suitable for obtaining force feedback, wear compensation and/or maintenance indication.

The actuator according to the invention can be applied for different purposes. In particular, the actuator is suitable for use in a brake calliper for an electrically actuatable disc brake, said calliper comprising an actuator as described before, and a claw piece carrying two opposite brake pads, said actuator comprising a screw and a nut one of which is rotatably supported with respect to the housing by means of an angular bearing, and a reduction gear means.

The invention will further be described with reference to the embodiments of figures 1 and 2.

Figure 1 shows a brake calliper, comprising an actuator according to the invention, in exploded view.

Figure 2 shows the brake calliper according to figure 1, in assembled state.

Figure 3 shows a detail.

Figure 4 shows a detail of the ball screw.

Figure 5 shows a further embodiment.

The brake calliper shown in figures 1 and 2 comprises a claw piece 1 carrying a fixed brake pad 2 and a displaceable brake pad 3. Said brake pads 2, 3 can be brought into co-operation with brake disc 4.

The displaceable brake pad 3 engages a ball screw mechanism 5 which by means of reduction gear means 6 is driven by motor 7. Said motor 7 may be provided with a sensor 40, connected to the motor shaft.

More in particular, the displaceable brake pad 3 is connected by means of bolt 8 and screwthreaded hole 9 to an actuating member 10. Said actuating member 10 engages the screw 11 by means of an bearing 12 capable to take up axial load. Said

actuating member is carried out as a piston 10, which is slidably, but non-rotatably held in a cylinder space 38 in the housing 17.

By means of balls 13, screw 11 engages the nut 14. Said nut 14 has an external screwthread 15, by means of which the nut 14 is connected to the housing 17. Moreover, a recirculating tube 18 for recirculating the balls 13 upon rotating the screw 11 with respect to said nut 14, extends through the nut.

The screw 11 has a bore 37 with internal grooves 19, which engage balls 20. Said balls 20 also engage the external grooves 21 of drive shaft 22.

By rotating drive shaft 22 through reduction gear means 6 and motor 7, the screw 11 is rotated as well. As a result, it is displaced backward or forward by the co-operation of its screw type groove 23 with the screw type groove 24 of the nut 14, by means of the balls 15.

Drive shaft 23 is connected to a carrier 25, which carries satellite gear wheels 26. Said satellite gear wheels 26 each engage a ring gear wheel 27 as well as a sun gear wheel 28.

Sun gear wheel 28 forms a unity with bevel gear 29 which together form a unitary gear wheel 30. Said unitary gear wheel 30 by means of bearing 31 is supported with respect to the nut 14.

The bevel gear 29 engages the bevel pinion 31, which in turn is driven by motor 7.

The bearing 31, which supports the unitary gear wheel with respect to the nut 14, comprises a sensor 33 for detecting the rotations of the screw mechanism, and thereby the displacement of the displaceable brake pad 3.

Housing 17 comprises a bore 34, through which a wire can be guided to the outside from said sensor 33.

The carrier 25 is supported with respect to the housing 17 by means of bearing 35; by means of bolts 36, motor 7 is connected to said housing 17.

According to the detail of figure 3, the connection between brake pad 3 and piston 10 may alternatively be obtained through edges 43 which are slidable mounted in grooves 43 of piston 10.

In order to accommodate the axial forces exerted on the ball screw mechanism when applying a brake force on the brake pads 2,3, the screw threads 23, 24 of screw 11 respectively nut 14 can be adapted according to the embodiment shown in figure

4. In cross-section, the threads 23 have raised parts 51, whereas the threads 24 have raised parts 52.

As a result of these shapes, the working lines 50 as defined by the contact angles and the ball conformity with the ball tracks, which define the load paths which play a role in force transfer, are in a more inclined position. The contact angle is between 45-70° in order to create optimized load carrying capacity for the ball screw in relation to the applied load specification.

The embodiment of figure 5 comprises a motor 61, having a stator 53 and a rotor 54 connected to a sleeve 55. The sleeve 55 is connected through the intermediate piece 56 to drive shaft 22. Alternatively, the sleeve 55 may be connected to the drive shaft 22 through a gear reduction.

Drive shaft 22 drives screw 11 of screw mechanism 5, through the groove 21, 19 in the respectively the drive shaft 22 and the screw 11, as well as through the balls 20 accommodated in said grooves 21, 19.

Via thrust bearing 69, the screw 11 can be connected to e.g. a brake pad in case of an actuator applied in a claw piece. The thrust bearing 69 comprises two rings 67, 68, and balls 12. One of the rings 67 may from a unity with the screw 11. The other ring 68 may comprise a locking groove 66 for locking a brake pad (not shown) thereto.

The screw 11 is rotatably and translatably held in a cylinder space 59 defined by insert ring 58 inserted in nut 14 of the screw mechanism 5. Nut 14 and screw 11 of screw mechanism 5 engage each other through balls 13, accommodated in respective screwthreaded threads of nut 14 and screw 11.

Sleeve 55 connected to rotor 54 of motor 61 is rotatably supported on the fixed nut 14 by means of bearings 63. These bearings have an outer race accommodated in the sleeve 55, and an inner ring 57 having appropriate raceways as well. The inner ring 57 is locked by means of locking ring 65. Furthermore, these bearings 63 have balls 64.

Alternatively, two separate standard ball or roller bearings may be applied.

The housing of the actuator is indicated by reference number 62.

Claims

1. Screw actuator, comprising a housing (17), a motor (7), an actuating member (10) and a screw mechanism (5) which provides a linear movement of the actuating member with respect to the housing in response to a rotational movement of the motor (7), which screw mechanism (5) comprises a screw (11), a nut (14) engaging each other by rolling elements (13), one of said screw (11) and nut (14) being rotatably supported with respect to the housing (17), and a reduction gear means (6), characterized in that the nut (14) is fixed with respect to the housing (17), and the screw (11) is rotatably supported with respect to the housing by means of the rolling elements (13).

2. Actuator according to claim 1, wherein the screw (11) is rotationally driven by the reduction gear means (6) through a coupling means (19-22) which allows axial displacements.

3. Actuator according to claim 2, wherein the coupling means comprises a shaft (22) accommodated within a bore (37) in the screw (11), the surface of the shaft (22) and bore having axial grooves (19, 21) which engage each other through balls (20).

4. Actuator according to any of the preceding claims, wherein the reduction gear means (6) is contained in a reduction gear module and the screw mechanism (5) is contained in a screw mechanism module.

5. Actuator according to claim 4, wherein the reduction gear means (6) comprises at least two gear reduction steps.

6. Actuator according to claim 6, wherein the reduction gear means comprises gear reduction steps of a different type, such as a planetary gear reduction step (25-28) and a right angle gear reduction step (28-31).

7. Actuator according to any of the preceding claims, wherein the screw (11) engages the actuating member (10) through a bearing (12) capable to carry axial and/or radial load.

8. Actuator according to any of claims 1-6, wherein the screw (11) is rigidly connected to the actuating member (10).

9. Actuator according to any of the preceding claims, wherein the actuating member is a piston (10), which is slidably held within a cylinder space (38, 59) of the housing (17).

10. Actuator according to claim 7 and 9, wherein the piston (10) is held non-rotatably by means of a groove and pin assembly, or by means of a ball/groove assembly.

11. Actuator according to claims 8 and 9, wherein the piston (10) is rotatably held within the cylinder space (38).

12. Actuator according to claim 9, wherein the cylinder space (59) is formed in the nut (14).

13. Actuator according to claim 4, wherein the modules are axially aligned.

14. Actuator according to claim 4, wherein the modules are in laterally shifted positions.

15. Actuator according to any of the preceding claims, wherein one or two laterally shifted motors are provided.

16. Actuator according any of the preceding claims 4-15, wherein the reduction gear means (6) comprises at least part of a planetary gear system having a stationary outer ring gear (27) with inwardly pointing gear teeth.

17. Actuator according to claim 16, wherein the reduction gear means comprises satellite gear wheels (26) which mesh with the ring gear (27) and which are accommodated on a carrier (25) connected to the shaft (22) engaging the screw mechanism (15).

18. Actuator according to claim 17, wherein the sun gear wheel (28) of the reduction gear means (6) is connected to a bevel gear (29) which mates with a motor gear, e.g. an angled or right angled gear transmission (32).

19. Actuator according to claim 18, wherein the sun gear wheel (28) and the bevel gear (29) are carried out as a unitary gear wheel (30) which is supported with respect to the nut (14) of the screw mechanism (5) by means of a rolling element bearing (31).

20. Actuator according to claim 18 or 19, wherein the pitch diameter of the bevel gear (29) is larger than the pitch diameter of the sun gear wheel (28).

21. Actuator according to any of the preceding claims, wherein a sensor (33) is provided for detecting rotational and/or translational movements of the screw mechanism (5).

22. Actuator according to claim 21, wherein control means are provided, said control means having an input for a control signal, e.g. from a brake pedal, and being connected to the sensor (33) for controlling the electric motor (7) on the basis of the control signal and the signal from the sensor (33).

23. Actuator according to claim 22, wherein the control device is arranged for providing a maintenance indication signal.

24. Actuator according to any of the preceding claims, wherein balls or rollers (13) of the screw mechanism (5) are coated so as to maintain the proper function of the screw (11) under dry-running conditions such as a diamond-like carbon coating.

25. Actuator according to any of the preceding claims, wherein the motor (7) is an electric motor.

26. Actuator according to any of claims 1-24, wherein the motor (7) is a hydraulic motor.

27. Actuator according to any of claims 1-24, wherein the motor (7) is a pneumatic motor.

28. Actuator according to any of the preceding claims, wherein at least one of the screw, nut, rolling elements and/or reduction gear components is obtained by hard turning.

29. Actuator according to any of the preceding claims, wherein the screw mechanism comprises rolling balls, and the grooves in the screw and nut are arranged for adapted contact angles in view of improved axial load bearing capacity.

30. Reduction gear module for use in the actuator according to any of claims 2-27.

31. Screw mechanism module for use in the actuator according to any of claims 2-27.

32. Drive module for use in the actuator according to any of claims 2-29.

33. Brake calliper for an electrically actuatable disc brake, said calliper comprising an actuator according to any of the preceding claims 1-29, and a claw piece (1) carrying two opposite brake pads (2, 3), said actuator comprising a screw mechanism (5) the screw (11) of which is rotatably supported with respect to the housing (17) by means of the balls (23) of the screw mechanism (5), a reduction gear means (6) and a motor (7).

34. Continuously variable transmission comprising two pulleys which each have two discs enclosing a V-shaped groove, as well as a belt engaging said grooves, the discs of each pulley being movable towards and away from each other so as to continually change the running radius of the belt, wherein the discs of each pulley are displaceable by means of an actuator according to any of claims 1-29.

35. Continuously variable transmission according to claim 34, wherein the drive of the discs comprises hydraulic means.

36. Continuously variable transmission according to claim 34, wherein the drive of the discs comprises mechanical means.

37. Clutch, comprising two clutch plates which can be brought into frictional engagement for transferring a drive couple, said clutch plates being connected to the shaft, comprising an actuator according to any of claims 1-29, said actuator having a hollow screw which accommodates one of the shafts.

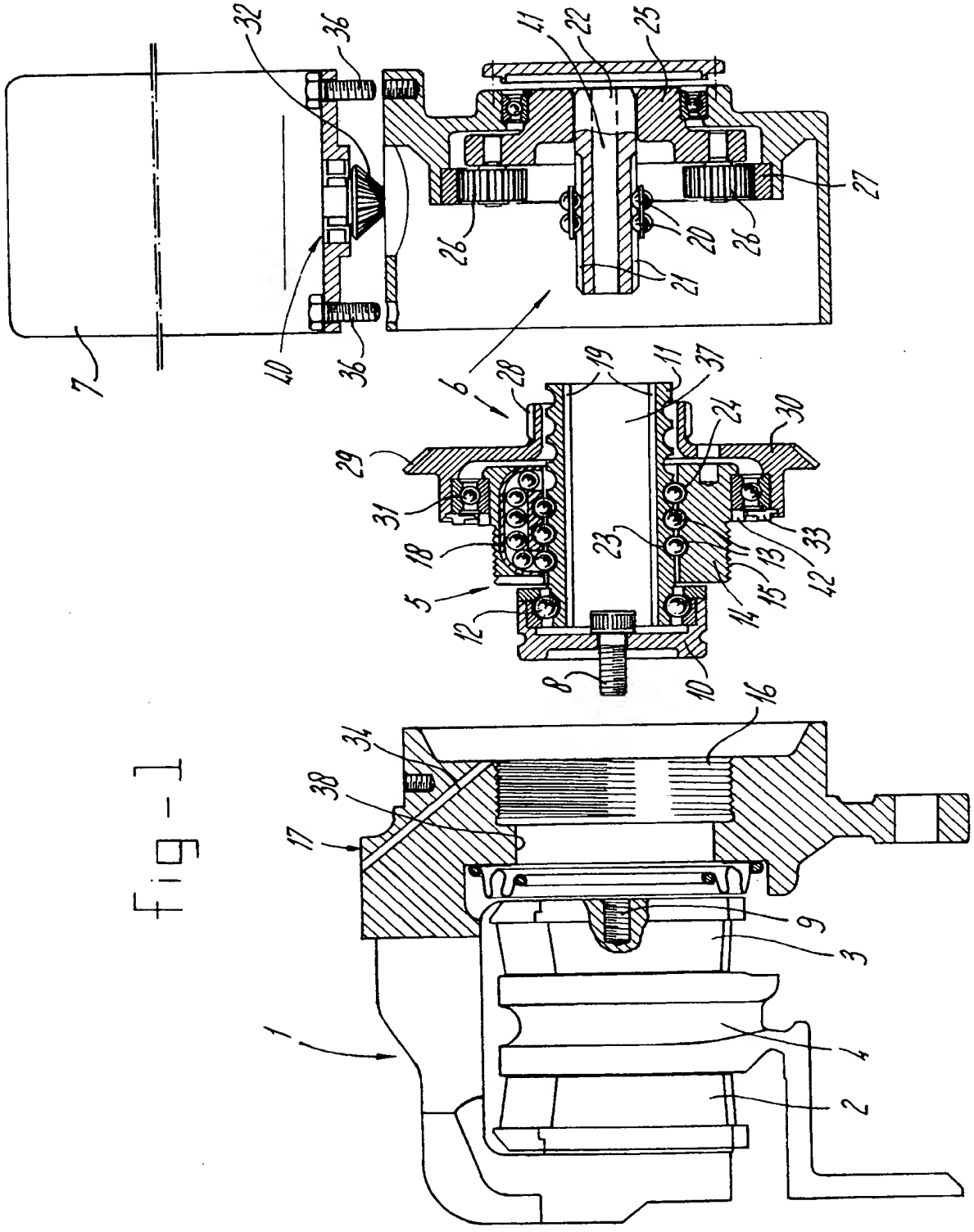
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Fig - 1

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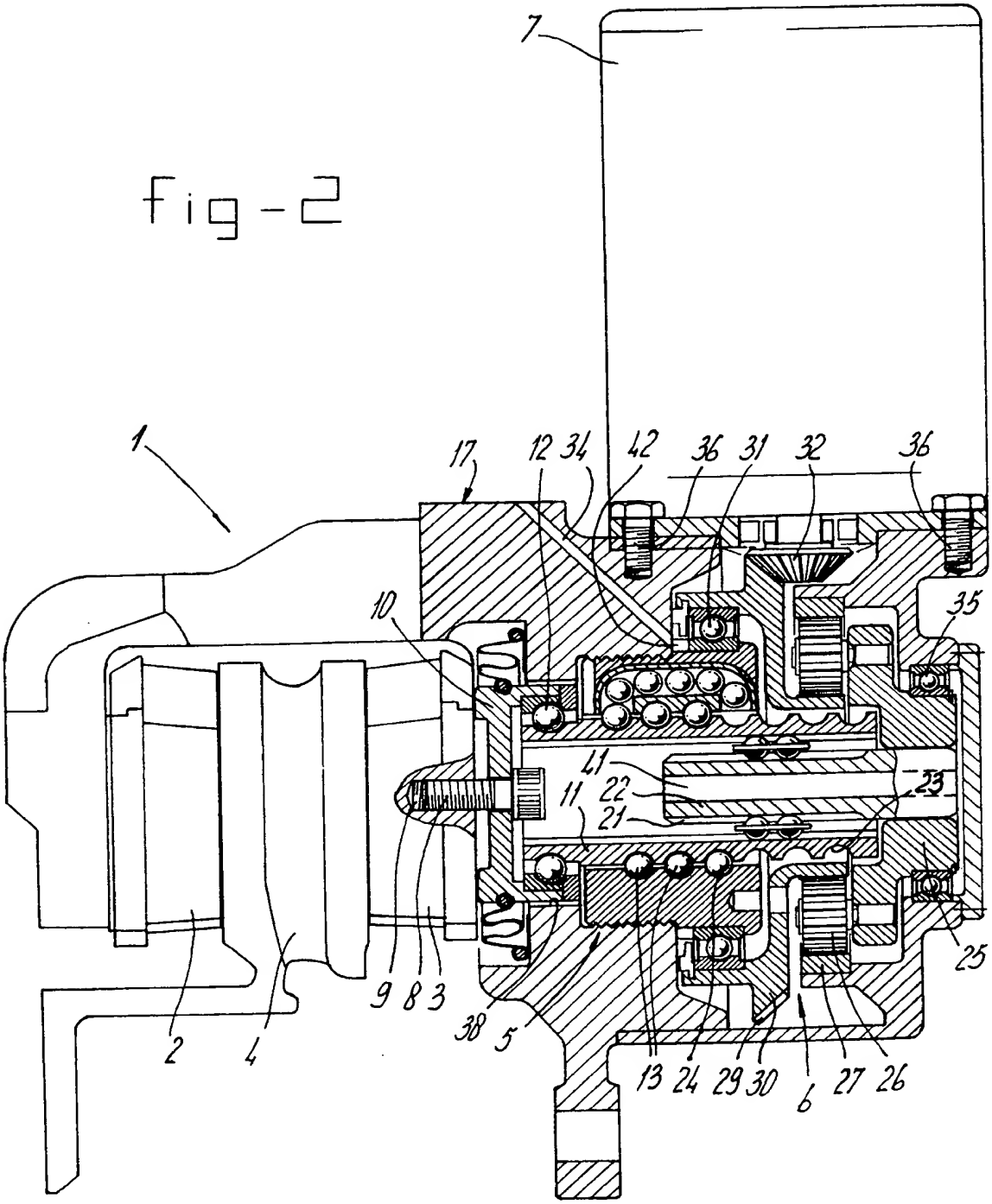
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Fig-3

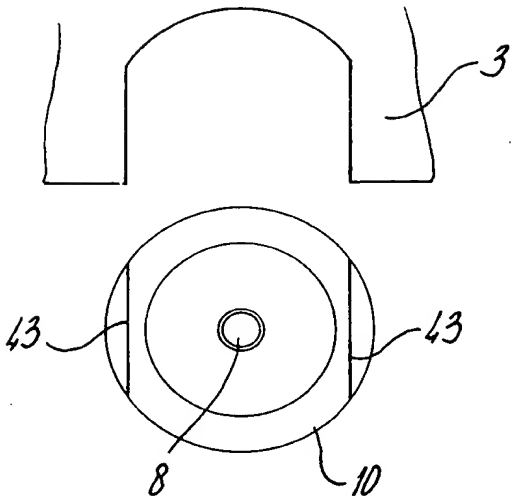
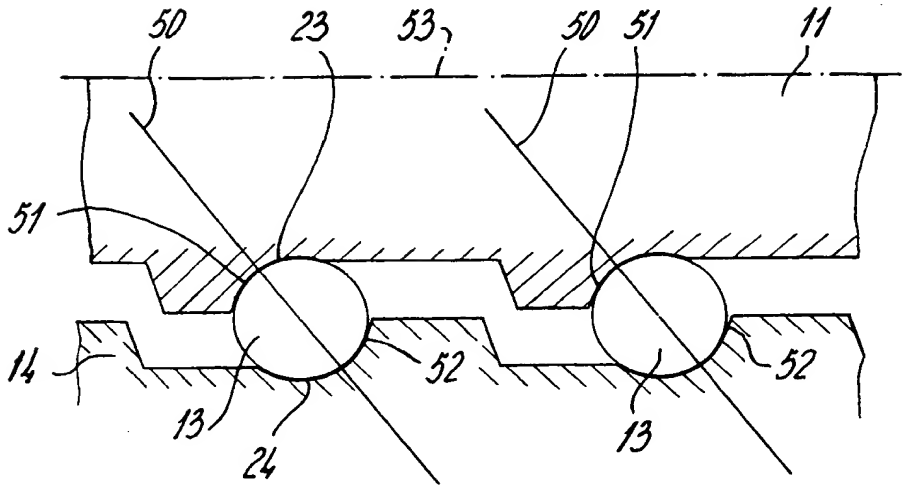


Fig-4



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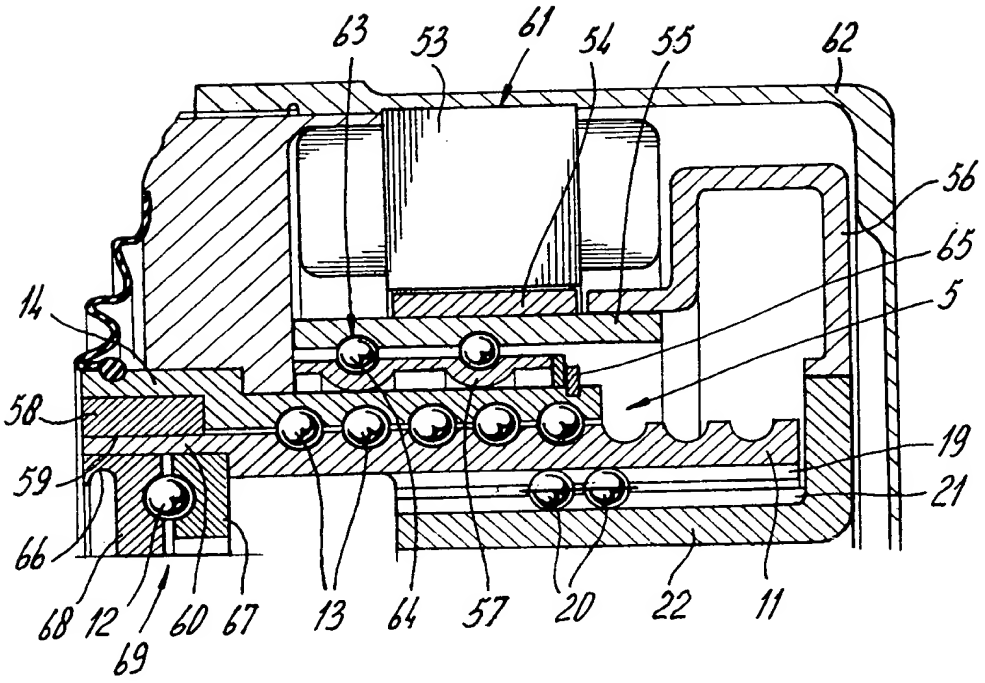
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Box III TEXT OF THE ABSTRACT (Continuation of item 5 f the first sh et)

The abstract is modified as follows:

line 1: after "housing" insert "(17)";
line 1: after "motor" insert "(7)";
line 1: after "member" insert "(10)";
line 2: after "mechanism" insert "(5)";
line 4: after "screw" insert "(11)";
line 4: after "nut" insert "(14)".
line 4: after "elements" insert "(13)";
line 6: after "means" insert "(6)";